Rational Speed Matching

Reporting Category	Number and Number Sense
Topic	Investigating rational numbers in percent, decimal, and fractional forms
Primary SOL	6.2 The student will b) identify a given fraction, decimal, or percent from a representation; c) demonstrate equivalent relationships among fractions, decimals, and percents; and d) compare and order fractions, decimals, and percents.
Related SOL	6.1

Materials

- Rational number cards (attached)
- Large number line
- Timer
- Bell
- Representing Rational Numbers chart (attached)
- Converting Rational Numbers chart (attached)

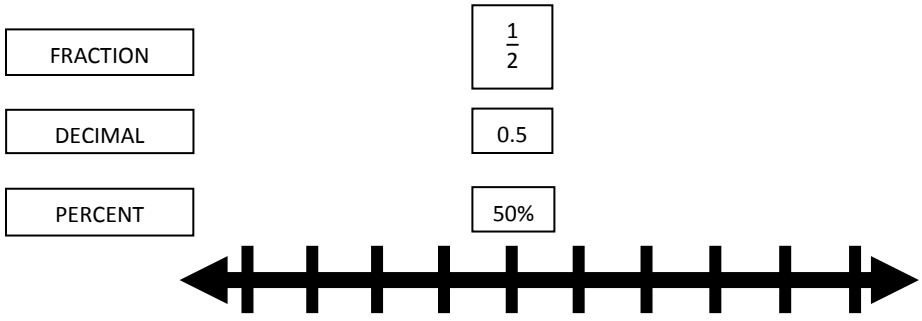
Vocabulary

fractions, decimals (earlier grades)

percentage, percent, ratio (6.1, 6.2)

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

Prior to the lesson, print the attached rational number cards on cardstock, and cut them out. All cards need to be the same size and color. Draw a number line on the board, or post a large number line on a wall. Above and to the left of the number line, post three signs, labeled FRACTION, DECIMAL, and PERCENT, as shown below.



Organize the classroom furniture by lining up the desks in a straight line along the length of the room and placing chairs on both sides of the line of desks. This will allow students to be seated in two rows facing each other across the line of desks.

In order for this activity to work properly, the total number of student participants must be an even number divisible by 3—e.g., 12, 18, 24, 30, or 36. If the number of students in the class does

not match one of these numbers, assign the largest possible number of students to be participants, and have the remaining students serve as volunteer timekeepers, number line organizers, and/or recorders for filling in the attached Representing Rational Numbers chart. If the total number of students does match, the teacher should keep time and direct all students to tape their numbers in order along the number line and complete their individual chart as numbers appear along the number line.

1. Begin the activity by reviewing how to convert between different forms of rational numbers—i.e., between fractions, decimals, and percents.
2. Give each student one rational number card, making sure that for each number distributed, all three forms of that number are handed out. Also distribute copies of the attached Representing Rational Numbers chart.
3. Divide the class into two groups by having students count off by twos. Seat one group (Group A) in random order on one side of the desks/tables, and the other group (Group B) on the other side.
4. Explain the following game directions to all students:
   - The object of the game is to match up all three forms of each rational number.
   - Students in Group B will remain seated throughout the game.
   - When the bell rings, you have 30 seconds to talk to the person opposite you to determine whether your two numbers match. If they do match, the student in Group A goes and stands behind the student with the match in Group B.
   - The bell will ring every 30 seconds, signaling all students in Group A to move one chair to their right. The student seated in the last chair at the end of the row will cycle to the first chair in the row.
   - The first group of three students to match all three forms of a number will go and tape their numbers in the correct position on the number line. They will also record their numbers on their Representing Rational Numbers charts.
   - The remaining students will continue to play until all numbers are matched, placed, and recorded. If necessary, numbers previously placed on the number line may be moved slightly to make room for additional numbers.

Assessment

- **Questions**
  - Looking at the fractions on the number line, what are some relationships between the numerators and denominators that help you in placing fractions in numerical order prior to converting them to decimals?
  - Why is it necessary to have multiple forms of rational numbers?
- **Journal/Writing Prompts**
  - Explain how this activity helped you understand the relationship between fractions, decimals, and percents.
  - Write your procedures for converting rational numbers from one form to another.

Extensions and Connections (for all students)

- Distribute copies of the attached Converting Rational Numbers chart, and have students complete it.

Strategies for Differentiation

- Post the rules for converting rational numbers from one form to another along a "circuit" around the room:
    - Converting a fraction to a decimal
    - Converting a decimal to a fraction
    - Converting a fraction to a percent
    - Converting a percent to a fraction
    - Converting a percent to a decimal
    - Converting a decimal to a percent
- Allow pairs of students to travel around the "converting circuit" with a printed sheet of numbers to convert, stopping at each station to do the conversion. Have each pair present their numbers and explain the connection among the forms.

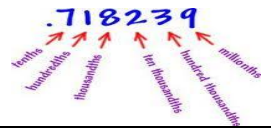
Representing Rational Numbers

Name _____ **Date** _____

Fraction	Decimal	Percent

Converting Rational Numbers

Name _____ **Date** _____

	**DECIMAL** 	PERCENT 
	0.39	
		33.3%
$\frac{11}{25}$		
	0.125	
		37.5%
$\frac{17}{20}$		
	0.112	
		50%
$\frac{5}{9}$		
	0.098	

Print cards on card stock and cut out.

75%	$\frac{3}{4}$	**0.75**
67%	$\frac{2}{3}$	**0.666**
38%	$\frac{19}{50}$	**0.38**

39%	$\frac{39}{100}$	**0.39**
56%	$\frac{5}{9}$	**0.55**
12.5%	$\frac{8}{64}$	**0.125**

9.8%	$\frac{49}{500}$	**0.098**
36.8%	$\frac{46}{125}$	**0.368**
100%	$\frac{99}{99}$	**1**

60%	$\frac{3}{5}$	**0.60**
33.3%	$\frac{1}{3}$	**0.333**
68.5%	$\frac{137}{200}$	**0.685**

72%	$\frac{18}{25}$	**0.72**
50%	$\frac{6}{12}$	**0.50**
14.3%	$\frac{1}{7}$	**0.142857**

37.5%	$\frac{3}{8}$	**0.375**
11.2%	$\frac{14}{125}$	**0.112**
41.5%	$\frac{83}{200}$	**0.415**

34.6%	$\frac{173}{500}$	**0.346**
25%	$\frac{7}{28}$	**0.25**
20%	$\frac{11}{55}$	**0.2**